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SUPPORT FOR THE AMENDMENT

This Amendment adds new Claims 31-32. Support for the amendments is found in the specification and claims as originally filed. In particular, support for new Claim 31 is found in Claim 5 and in the specification at least at page 15, lines 1-8. Support for new Claim 32 is found in Claim 5. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-7, 9, 11-20 and 28-32 will be pending in this application. Claims 1, 5, 6 and 31-32 are independent. Claims 9, 14-20 and 28-30 are withdrawn from consideration.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the courtesies extended to their representative during the May 12, 2004, personal interview.

As discussed at the personal interviews, the present invention provides polishing liquid compositions that, when used to polish a surface comprising an insulating layer and a metal layer, prevents the occurrence of dishing.

Claims 1-3, 7 and 11 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,383,240 ("Nishimoto"). Applicants respectfully traverse the rejection because Nishimoto is not prior art to the above-identified application. Nishimoto was filed on September 29, 2000. In contrast, the effective U.S. filing date of the above-identified national stage application is the international filing date of July 7, 2000. See, e.g., M.P.E.P. at page 700-21, column 2; and § 1893.03(b). Because Nishimoto was filed after the effective U.S. filing date of the

above-identified application, Nishimoto is not prior art to the above-identified application. Thus, the rejection over Nishimoto should be withdrawn.

Claims 5 and 12 are rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,783,489 ("Kaufman-489"). Kaufman-489 discloses a chemical mechanical polishing (CMP) slurry comprising at least two oxidizing agents, an organic acid and an abrasive. Kaufman-489 at abstract. Kaufmann-489 discloses:

> The CMP slurry of this invention includes an organic acid. A wide range of conventional organic acids, salts of organic acids, and mixtures thereof are useful in the CMP slurry of the present invention to enhance the selectivity to oxide polishing rate, such as monofunctional acids, di-functional acids, hydroxyl/carboxylate acids, chelating, non-chelating acids, and their salts. Preferably, the organic acid is selected from the group of acetic acid*2, adipic acid*2, butyric acid*2, capric acid*1, caproic acid*2, caprylic acid*1, citric acid*2, glutaric acid*2, glycolic acid*2, formic acid*2, fumaric acid*2, lactic acid*2, lauric acid*1, malic acid*2, maleic acid*2, malonic acid*2, myristic acid*1, oxalic acid*2, palmitic acid*1, phthalic acid*2, propionic acid*2, pyruvic acid*2, stearic acid*1, succinic acid*2, tartaric acid*2, valeric acid*2 and derivatives, including salts thereof.
>
> The organic acid or salt should be present in the final CMP slurry, individually or in combination with other organic acids or salts, in an amount sufficient to enhance the oxide selectivity without detrimentally effecting the stability of the CMP slurry. Kaufmann-489 at column 6, lines 1-19 (umbered asterisks added).

In the passage above, an acid designated *1 belongs to independent Claim 5's aliphatic carboxylic acids having 7 to 24 carbon atoms and an acid designated *2 belongs to Claim 5's etching agent.

However, Kaufmann-489 fails to disclose or exemplify the specific combination of acids of independent Claim 5 of an (i) aliphatic carboxylic acid having 7 to 24 carbon atoms and/or a salt thereof and (ii) the recited etching agent. Claim 5's acids synergistically combine to maintain a practical polishing speed while avoiding excessive etching of a metal layer, which leads to undesirable dishing. See, e.g., specification at page 18, lines 1-10. Given the large number of acid combinations possible from Kaufman-489's list of acids, there is no reasonable expectation that Kaufman-489 would successfully lead the skilled artisan to

the Claim 5 combination of acids (i) and (ii) necessary to both maintain polishing speed and prevent dishing. A system of glycolic acid and citric acid, both of which belong to the Claim 5 group (ii) of etching agents and appear in Kaufman-489's list of acids, fails to prevent dishing. See, Comparative Example II-6 in the specification at Table 4, reproduced below. Since Kaufman-489 fails to suggest all the limitations of independent Claim 5, the rejection under 35 U.S.C. § 102(b) over Kaufman-489 should be withdrawn.

Any *prima facie* case for the obviousness of independent Claim 5 is rebutted by the significant reduction in dishing achieved by Claim 5's specific combination of (i)"an aliphatic carboxylic acid having 7 to 24 carbon atoms and/or a salt thereof" and (ii) "an etching agent comprising an organic acid" from the recited Markush group. See the Examples and Comparative Examples of Tables 3 and 4, which are reproduced below.

Table 3

Ex. No.	Aliphatic Carboxylic Acid and/or Its Salt		Etching Agent		Hydrogen Peroxide	Abrasive	pH
	Kind	Content	Kind	Content	Content	Kind	
II–1	Octanoic acid	0.6[1)]	Glycolic acid	2.0[1)]	4.0[1)]	Colloidal Silica	7.6
II–2	Nonanoic acid	0.3	Glycolic acid	2.0	4.0	Colloidal Silica	7.7
II–3	Heptanoic acid	1.2	Glycolic acid	2.0	4.0	Colloidal Silica	7.6
II–4	Decanoic acid	0.3	Glycolic acid	2.0	4.0	Colloidal Silica	7.7
II–5	Oleic acid	0.3	Glycolic acid	2.0	4.0	Colloidal Silica	8.0
II–6	Isooctanoic acid[2)]	1.5	Glycolic acid	2.0	4.0	Colloidal Silica	7.7
II–7	Octanoic acid	1.2	Citric acid	2.0	2.0	Fumed Silica	7.6
II–8	Octanoic acid	1.0	Phthalic acid	2.0	2.0	Fumed Silica	7.9
II–9	Octanoic acid	1.5	Aminotri–(methylene–phosphonic acid)	2.0	2.0	Fumed Silica	7.6
II–10	Octanoic acid	0.4	Glycolic acid	2.0	–	Colloidal Silica	7.6
II–11	Octanoic acid	1.0	Hydrochloric acid	2.0	2.0	Colloidal Silica	7.7
II–12	Octanoic acid	0.5	Sulfuric acid	2.0	2.0	Colloidal Silica	7.9

– Continued –

– Continued –

Ex. No.	Evaluation for Properties				
	Relative Polishing Speed	Relative Etching Speed	Comp. Ex. To Which Evaluation Was Based	Dishing	Copper Surface Condition
II–1	1.0	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–2	1.0	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–3	1.0	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–4	0.9	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–5	0.9	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–6	1.0	0.1 or less	Comp. Ex. II–1	Absence	No Roughening
II–7	1.0	0.1 or less	Comp. Ex. II–2	Absence	No Roughening
II–8	0.9	0.1 or less	Comp. Ex. II–3	Absence	No Roughening
II–9	0.9	0.1 or less	Comp. Ex. II–4	Absence	No Roughening
II–10	0.9	0.1 or less	Comp. Ex. II–5	Absence	No Roughening
II–11	0.9	0.1 or less	Comp. Ex. II–11	Absence	No Roughening
II–12	0.9	0.1 or less	Comp. Ex. II–12	Absence	No Roughening

Note 1): % by weight
2): Secanoic C8 acid (trade name, commercially available from Exon Chemicals K.K.)

Table 4

Comp. Ex. No.	Aliphatic Carboxylic Acid and/or Its Salt		Etching Agent		Hydrogen Peroxide	Abrasive	pH
	Kind	Content	Kind	Content	Content	Kind	
II–1	–	–	Glycolic acid	2.0[1)]	4.0[1)]	Colloidal Silica	7.6
II–2	–	–	Citric acid	2.0	2.0	Fumed Silica	7.6
II–3	–	–	Phthalic acid	2.0	2.0	Fumed Silica	7.9
II–4	–	–	Aminotri–(methylene–phosphonic acid)	2.0	2.0	Fumed Silica	7.6
II–5	–	–	Glycolic acid	2.0	–	Colloidal Silica	7.6
II–6	–	–	Glycolic acid Citric acid	1.0 1.0	4.0	Colloidal Silica	7.6
II–7	Octanoic acid Heptanoic acid	0.5[1)] 0.5	–	–	4.0	Colloidal Silica	7.8
II–8	Oleic acid	0.5	–	–	4.0	Colloidal Silica	7.6
II–9	Benzo–triazole	0.3	Glycolic acid	2.0	4.0	Colloidal Silica	7.6
II–10	Ammonium Poly–acrylate	1.0	Citric acid	2.0	2.0	Fumed Silica	7.6
II–11	–	–	Hydrochloric acid	2.0	2.0	Colloidal Silica	7.7
II–12	–	–	Sulfuric acid	2.0	2.0	Colloidal Silica	7.9

– Continued –

– Continued –

Comp. Ex. No.	Evaluation for Properties				
	Relative Polishing Speed	Relative Etching Speed	Comp. Ex. To Which Evaluation Was Based	Dishing	Copper Surface Condition
II–1	1.0	1.0	–	Presence	No Roughening
II–2	1.0	1.0	–	Presence	No Roughening
II–3	1.0	1.0	–	Presence	No Roughening
II–4	1.0	1.0	–	Presence	No Roughening
II–5	1.0	1.0	–	Presence	No Roughening
II–6	1.3	1.5	Comp. Ex. II–1	Presence	No Roughening
II–7	0.1 or less	0.1 or less	Comp. Ex. II–1	The polishing speed was too slow to be evaluated.	
II–8	0.1 or less	0.1 or less	Comp. Ex. II–1		
II–9	0.1 or less	0.1 or less	Comp. Ex. II–1		
II–10	1.2	0.1 or less	Comp. Ex. II–2	Absence	Presence of Roughening
II–11	1.0	1.0	–	Presence	No Roughening
II–12	1.0	1.0	–	Presence	No Roughening

Note 1): % by weight

Because Kaufman-489 fails to suggest the significant reduction in dishing achieved by independent Claim 5's specific combination of (i) "an aliphatic carboxylic acid having 7 to 24 carbon atoms and/or a salt thereof" and (ii) "an etching agent comprising an organic acid" from the recited Markush group, any *prima facie* case of obviousness based on Kaufman-489 is rebutted. Thus, Kaufman-489 fails to have rendered obvious independent Claim 5.

Claims 6 and 13 are rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,063,306 ("Kaufman-306"). Kaufman-306 discloses a chemical mechanical polishing slurry that can include an organic amino compound such as nonylamine and dodecylamine. Kaufman-306 at column 6, lines 12-13. However, the singly substituted alkylamines of Kaufman-306 (see definitions of "nonylamine" and "dodecylamine" in Handbook of Chemistry and Physics, 52d edition, pages C-274 and C-394, copies attached) fail to suggest the triply substituted amine compound of independent Claim 6. Thus, the rejection over Kaufman-306 should be withdrawn.

Pursuant to M.P.E.P. § 821.04, after independent product Claims 1, 5 and 6 are allowed, Applicants respectfully request rejoinder, examination and allowance of withdrawn method Claims 9, 14-20 and 28-30, which include all of the limitations of independent product Claims 1, 5 and 6, respectively.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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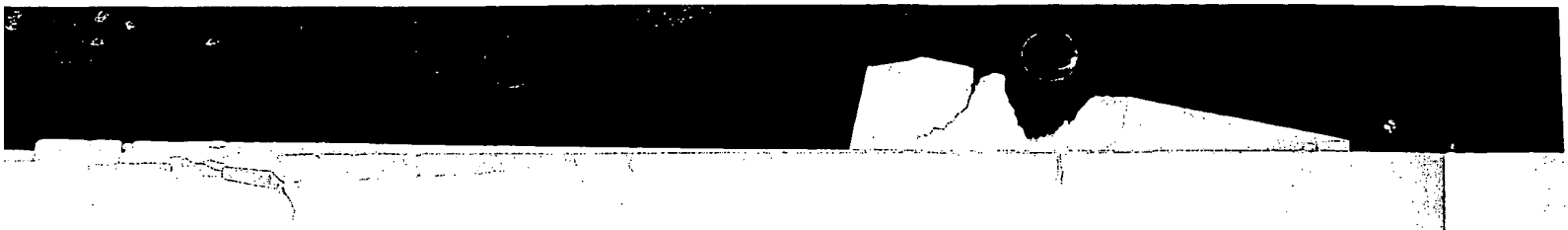

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No.	Name	Synonyms and Formula	Mol. wt.	Color. crystalline form. specific rotation and λ_{max} (log ε)	m.p. °C	b.p. °C	Density	n_D	Solubility: w	al	eth	ace	bz	other solvents	Ref.
	Disulfide														
d263	—.di-2-tolyl		246.40	lf (al) λ^{al} 240 (4.21), 280 (3.45), 325 sh (2.95)	38–9				i	s	s	s	...	oss	B6², 342
d264	—.di-4-tolyl		246.40	nd or lf (al) λ^{al} 242 (4.29), 270 (3.65), 315 sh (3.2)	47–8	210–15^{20}	1.114^{51}		i	s	v	s	...		B6², 400
—	Ditaine	*see* Echitamine													
—	Ditan	*see* Methane, diphenyl-													
Ω d265	1,4-Dithiane	Diethylene disulfide	120.25	mcl pr λ^{al} 225 sh (2.54), 292 (2.5)	111–2	199–200			δ^h	s^h	s	...	...	CS_2 s au s^h	B19², 6
d266	1,3,5-Dithiazine, 4,5-dihydro-5-methyl-	Methylthioformaldine	135.25	nd (eth)	65	ca. 185d			...	s	s	...	...	aa s	B27, 460
d267	1,4-Dithiine 2,5-diphenyl-		268.40	ye pr (al) λ 260 (4.35), 308 (3.95)	118–9				i	s	...	...	v	con sulf s alk s	B19², 46
—	Dithioacetic acid	*see* Acetic acid, thionothiolo-													
d268	1,3-Dithiolane	Trimethylene 1,3-disulfide.	106.21	λ^{cy} 207 (3.13), 247 (2.56)	−51	175^{760}	1.259^{17}	1.5975^{15}	...	s	s	...	...	xyl s	B19², 3
Ω d269	Dithizone	Diphenylthiocarbazone. Formazyl mercaptan. $C_6H_5N{:}NCSNHNHC_6H_5$	256.33	bl-bk (chl-al) λ^{max} 445 (4.29), 610 (4.51)	165–9d				i	δ	δ	...	...	chl. alk s	B16, 26
d270	Diurea	Dicarbamide. *p*-Urazine.	116.08	pr (w)	270				δ^h	δ	...	...	...	aa δ	B26², 258
—	Divarinol	*see* Benzene, 1,3-dihydroxy-5-propyl-													
Ω d271	Djenkolic acid	*β,β'*-Methylenedithiodialanine. $HO_2CCH(NH_2)CH_2SCH_2SCH_2CH(NH_2)CO_2H$	254.33	nd (w, HCl) $[\alpha]_D^{25}$ −47.5 (1 % HCl, c = 2)	300–50d				s^h	...	...	...	...	dil ac s dil alk s	B4³, 1591
Ω d272	Docosane*	$CH_3(CH_2)_{20}CH_3$	310.61	pl (to), cr (eth)	44.4	368.6^{760} 213^{10}	0.7944$^{20}_4$	1.4455^{20}	i	s^h	v	...	...	chl s	B1³, 574
Ω d273	Docosanoic acid*	Behenic acid. Docosoic acid. $CH_3(CH_2)_{20}CO_2H$	340.60	nd	80	306^{60}	0.8223^{90}	1.4270^{100}	δ	δ	δ	...	...		B2³, 373
d274	—.ethyl ester	Ethyl behenate. $CH_3(CH_2)_{20}CO_2C_2H_5$	368.65	nd (al), cr (ace)	50	240–2^{10}	0.8820^{51}		i	s	s	...	...		B2², 374
d275	—.methyl ester	Methyl behenate. $CH_3(CH_2)_{20}CO_2CH_3$	354.62	nd (ace)	54	224–5^{15}		1.4339^{60}	i	s	s	...	...		B2², 373
Ω d276	1-Docosanol*	Docosyl alcohol. $CH_3(CH_2)_{21}OH$	326.61	(ace, chl)	71 (87)	180$^{0.22}$			δ	v	δ v^h	...	...	chl s MeOH v peth v^h	B1³, 1846
d277	4,7,11-Docosatrien-18-ynoic acid	Clupanodonic acid. $CH_3(CH_2)_2C{:}C(CH_3)_3CH{:}CH\ CH_2$ | $HO_2CCH_2CH{:}CHCH_2CH{:}CHCH_2$	330.52	pa ye λ^{MeOH} 240 (4.28), 275 (4.2), 300 (4.2), 328 (4.2), 346 (3.7)	< −78	236^5	0.9290^{20}	1.4868^{20}	i	...	s	...	...		C49, 1550
Ω d278	13-Docosenoic acid* (*cis*)	Erucic acid. $CH_3(CH_2)_7CH{:}CH(CH_2)_{11}CO_2H$	338.58	nd (al)	33–4	265^{15}	0.860$^{25}_4$	1.4758^{20}	i	s	v	...	...	MeOH v	B2², 445
Ω d279	—(*trans*)*	Brassidic acid. Brassic acid. Isoerucic acid. $CH_3(CH_2)_7CH{:}CH(CH_2)_{11}CO_2H$	338.58	pl (al)	61.5	282^{30}	0.8585$^{67}_4$	1.4472^{64}	i	δ	δ	...	...		B2², 447
d280	—.anhydride (*trans*)*	Brassidic anhydride. $[CH_3(CH_2)_7CH{:}CH(CH_2)_{11}CO]_2O$	659.15	nd (al), pl (eth, ace, peth)	64		0.835$^{70}_4$	1.4366^{100}	i	δ	s	s	...	peth s	B2², 448
d281	—.13,14-diiodo-, ethyl ester* (*trans*)	Iodobrassid. $CH_3(CH_2)_7CHI{:}CHI(CH_2)_{11}CO_2C_2H_5$	618.43	nd or sc	37 (40)	d			i	s v^h	v	...	v	chl v	B2², 448
d282	13-Docosynoic acid*	Behenolic acid. $CH_3(CH_2)_7C{:}C(CH_2)_{11}CO_2H$	336.57	mcl pr or nd (al)	59.5				i	v	v	...	...	chl s	B2², 462
Ω d282¹	Dodecanal*	Lauraldehyde. $CH_3(CH_2)_{10}CHO$	184.33	lf	44.5 (12)	185^{100} 100$^{3.5}$	0.8352$^{15}_4$	1.435^{22}	i	s	s	...	...		B1³, 2911
d283	—.dimethyl acetal	1,1-Dimethoxydodecane*. $CH_3(CH_2)_{10}CH(OCH_3)_2$	230.40			132–4^5		1.4310^{25}	...	v	v	...	...	MeOH v	Am 80, 6613
Ω d284	Dodecane*	$CH_3(CH_2)_{10}CH_3$	170.34		−9.6	216.3^{760} 91.5^{10}	0.7487$^{20}_4$	1.4216^{20}	i	v	v	v	...	chl. CCl_4 v	B1³, 539
Ω d285	—.1-amino-*	Dodecylamine. Laurylamine. $CH_3(CH_2)_{11}NH_2$	185.36		28.3	259^{760} 126.5^{10}	0.8015$^{20}_4$	1.4421^{20}	δ	∞	∞	...	∞	chl. CCl_4 ∞	B4, 200
d286	—.—.acetate	$CH_3(CH_2)_{11}NH_2.CH_3CO_2H$	245.41		fr. 69.5				v	v	...	...	δ		C48, 2525
d287	—.—.hydrochloride	$CH_3(CH_2)_{11}NH_2.HCl$	221.82		98				v	v	i	...	δ s^h		Am 74, 4287
Ω d288	—.1-bromo-*	Dodecyl bromide. Lauryl bromide. $CH_3(CH_2)_{11}Br$	249.24		−9.5	276^{760} 139^{10}	1.0399$^{20}_4$	1.4583^{20}	i	s	s	∞	...		B1³, 542
d289	—.1-bromo-12-fluoro-*	$F(CH_2)_{12}Br$	267.23			85–6$^{0.15}$		1.4524^{25}	i	v	v	s	...		C51, 7300
Ω d290	—.1-chloro-*	Dodecyl chloride. Lauryl chloride. $CH_3(CH_2)_{11}Cl$	204.79		fr. −9.3	260^{760} 126.4^{10}	0.8682$^{20}_4$	1.4433^{20}	i	v	...	∞	s	CCl_4 ∞ lig ∞	B1³, 541

For explanations, symbols and abbreviations see beginning of table. For structural formulas see end of table.

No.	Name	Synonyms and Formula	Mol. wt.	Color, crystalline form, specific rotation and λ_{max} (log ε)	m.p. °C	b.p. °C	Density	n_D	Solubility: w	al	eth	ace	bz	other solvents	Ref.
	2-Nonadecanone														
Ω n511	2-Nonadecanone*	Methyl *n*-heptadecyl ketone. $CH_3(CH_2)_{16}COCH_3$	282.52	pl (al)	57	266.5^{110} 165^{2}	0.8108^{80}	.....	i	δ s^h	v	s v^h	...	chl, CCl_4 v to v^h bz s, v^h	B1², 773
n512	—, oxime*	$CH_3(CH_2)_{16}C(:NOH)CH_3$	297.53	cr (al)	76.5–7.5	.....	.....	.....	...	s^h	...	...	...	.....	B1, 718
n513	4-Nonadecanone*	*n*-Propyl *n*-pentadecyl ketone. $CH_3(CH_2)_{14}CO(CH_2)_2CH_3$	282.52	lf (al)	50.5	211^{11} δd	.....	.....	i	δ	v	v	...	.....	B1², 773
Ω n514	10-Nonadecanone*	Caprinone. Dinonyl ketone. $[CH_3(CH_2)_7CH_2]_2CO$	282.52	lf (al)	65.5 (58)	> 350 $155.6^{1.1}$	.....	.....	i	δ s^h	s	s	v	chl, lig s	B1, 718
n515	1-Nonadecyne*	$CH_3(CH_2)_{16}C{\equiv}CH$	264.50	.....	37–8 (33)	327^{760} 181.6^{10}	0.8054_4^{20}	1.4488^{20}	...	...	s	s	s	.....	B1³, 1030
n516	1,8-Nonadiyne*	$HC{\equiv}C(CH_2)_3C{\equiv}CH$	120.20	.....	−27.3	162^{760} 55^{13}	0.8158_4^{20}	1.4490^{20}	...	...	s	s	...	.....	B1³, 1063
Ω n517	Nonanal*	*n*-Nonylaldehyde. Pelargonaldehyde. $CH_3(CH_2)_7CHO$	142.24	.....	.....	190–2 93.5^{23}	0.8264_4^{22}	1.4273^{20}	...	...	s	...	...	.....	B1², 761
n518	—, oxime*	$CH_3(CH_2)_7CH:NOH$	157.26	lf (dil al)	64	.....	.....	.....	i	s^t	s	s	...	os s	B1², 761
Ω n519	Nonane*	$CH_3(CH_2)_7CH_3$	128.26	.....	−51	150.798^{760} 39^{10}	0.7176_4^{20}	1.4054^{20}	i	v	v	∞	∞	chl, hp ∞	B1³, 502
Ω n520	—, 1-amino-*	*n*-Nonylamine. $CH_3(CH_2)_7CH_2NH_2$	143.28	.....	−1	202.2^{760} 80.8^{10}	0.7886_4^{20}	1.4336^{20}	δ	s	s	...	...	.....	B4³, 393
n521	—, 1-chloro-*	*n*-Nonyl chloride. $CH_3(CH_2)_7CH_2Cl$	162.71	.....	−39.4	203.4^{760} 80.5^{10}	0.8720_4^{20}	1.4345^{20}	i	...	s	...	...	chl s	B1², 128
n522	—, 2-chloro-*	2-Nonyl chloride. $CH_3(CH_2)_6CHClCH_3$	162.71	.....	.....	190^{764}	0.8790^{20}	1.4420^{20}	i	...	...	...	...	chl s	B1, 166
n523	—, 5-chloro-*	5-Nonyl chloride. $(CH_3CH_2CH_2CH_2)_2CHCl$	162.71	.....	.....	85–7¹⁴	0.8639_4^{25}	1.4314^{25}	i	...	v	...	...	.....	B1², 128
n524	—, 1-chloro-9-fluoro-*	$FCH_2(CH_2)_7CH_2Cl$	180.70	.....	.....	102–2.5¹¹	0.966_4^{20}	1.4301^{25}	i	v	v	...	...	.....	C51, 7300
Ω n525	Nonanedioic acid*	Azelaic acid. 1,7-Heptanedicarboxylic acid*. $HO_2C(CH_2)_7CO_2H$	188.23	lf or nd	106.5	> 360d 287^{100} 225.5^{10}	1.225_4^{25}	1.4303^{111}	δ s^h	s	δ	...	δ v^h	.....	B2², 602
Ω n526	—, dichloride	Azelayl dichloride. $ClCO(CH_2)_7COCl$	225.12	.....	.....	166^{18} $140^{0.4}$	.....	1.4680^{20}	d	d^h	s	...	v^h	.....	B2, 709
Ω n527	—, diethyl ester*	Ethyl azelate. $C_2H_5O_2C(CH_2)_7CO_2C_2H_5$	244.34	λ^{al} 255 (0.7), 262 (0.8), 273 (0.7)	−18.5	291–2 $174–5^{20}$	0.9729_4^{20}	1.43509^{20}	i	s	s	...	...	.....	B2², 603
Ω n528	—, di(2-ethylbutyl) ester*	Di-2-ethylbutyl azelate. $CH_3[(CH_2)_3CO_2CH_2CH(C_2H_5)_2]_2$	356.55	.....	−45	230^{5}	0.928_4^{25}	1.443^{25}	i	s	...	s	s	.....	B2², 1787
n529	—, di(2-ethylhexyl) ester*	Di-2-ethylhexyl azelate. $CH_3[(CH_2)_5CO_2CH_2CH(C_2H_5)C_4H_9]_2$	1412.66	.....	−78	237^{5}	0.915_4^{25}	1.446^{25}	i	s	...	s	s	.....	B2², 1787
Ω n530	—, dimethyl ester*	Dimethyl azelate. $CH_3O_2C(CH_2)_7CO_2CH_3$	216.28	.....	.....	156^{20} 128^{5}	1.0082_4^{20}	1.4367^{20}	i	s	...	s	s	os s	B2¹, 290
Ω n531	—, dinitrile	Azelanitrile. $NC(CH_2)_7CN$	150.23	.....	.....	198–9²³ 160^{3}	$0.9290^{19.5}$	1.4518^{19}	i	v	v	...	v	.....	B2¹, 290
n532	—, diphenyl ester*	Diphenyl azelate. $C_6H_5O_2C(CH_2)_7CO_2C_6H_5$	340.42	nd (al)	59–60 (49)	.....	.....	.....	i	δ s^h	v	...	v	.....	B6³, 606
Ω n533	1,9-Nonanediol*	Nonamethylene glycol. $HOCH_2(CH_2)_7CH_2OH$	160.26	cr (bz)	45.8	173–5²⁰	.....	.....	δ	v	v	...	s^h	lig i	B1³, 2226
Ω n534	Nonanoic acid*	*n*-Nonylic acid. Pelargonic acid. $CH_3(CH_2)_7CO_2H$	158.24	.....	fp 12.24 15	255^{760} 150^{20}	0.9057_4^{20}	1.4343^{19}	i	s	s	...	...	chl s	B2², 360
n535	—, amide	Nonanamide*; Pelargonamide. $CH_3(CH_2)_7CONH_2$	157.26	.....	99.2–9.7	sub	0.8394^{110}	1.4248^{110}	i	δ	δ	...	...	.....	B2², 822
Ω n536	—, chloride	Nonanoyl chloride*. Pelargonyl chloride. $CH_3(CH_2)_7COCl$	176.69	.....	−60.5	215.35^{760} 98^{15}	0.9463_4^{25}	.....	d	d	s	s	...	.....	B2², 308
Ω n537	—, ethyl ester*	$CH_3(CH_2)_7CO_2C_2H_5$	186.30	.....	−36.7	227^{760} $96–8^{10}$	0.8657_4^{20}	1.4220^{20}	i	s	s	s	...	.....	B2², 307
Ω n538	—, methyl ester*	$CH_3(CH_2)_7CO_2CH_3$	172.27	.....	.....	$213–4^{757}$ $104–6^{23}$	0.8799^{15}	1.4214^{20}	i	s	s	...	...	.....	B2², 307
Ω n539	—, nitrile	Nonanonitrile*. Octyl cyanide. Pelargonitrile. $CH_3(CH_2)_7CN$	139.24	.....	−34.2	224.4^{760} 91.9^{10}	0.8178_4^{20}	1.4255^{20}	i	s	s	...	...	.....	B2², 828
n540	—, piperazinium salt	$2[CH_3(CH_2)_7CO_2H].C_4H_{10}N_2$	402.62	wh	95.1–6.2	.....	.....	.....	s^h	s	i	...	...	.....	Am70, 2758
n541	—, 9-amino*	$H_2NCH_2(CH_2)_7CO_2H$	173.26	.....	185.6–6.6	.....	.....	.....	s	s	...	...	...	.....	B4³, 1479
n542	—, 9-fluoro-*	*ω*-Fluoropelargonic acid. $FCH_2(CH_2)_7CO_2H$	176.23	.....	*ca.* 18	89–$90^{0.2}$	.....	1.4289^{25}	δ	v	v	...	...	.....	C52, 1918
Ω n543	1-Nonanol*	Nonyl alcohol. $CH_3(CH_2)_7CH_2OH$	144.26	.....	−5.5	213.5^{760} 118^{15}	0.8273_4^{20}	1.4333^{20}	i	s	s	...	...	.....	B1³, 1743
n549	5-Nonanol, 5-butyl-*	Tri-*n*-butyl carbinol. $[CH_3(CH_2)_3]_3COH$	200.37	.....	20	230–5d 118–20^{17}	0.8408_4^{20}	1.4445^{20}	i	s	...	...	...	.....	B1³, 1802
n550	1-Nonanol, 9-chloro-*	Nonamethylene chlorohydrin. $ClCH_2(CH_2)_7CH_2OH$	178.71	.....	28	146–8¹⁴	.....	1.4575^{20}	i	v	v	...	...	.....	C51, 7300
n551	—, 9-fluoro-*	Nonamethylene fluorohydrin. $FCH_2(CH_2)_7CH_2OH$	162.25	.....	.....	125–6¹⁵	0.9284_4^{20}	1.4279^{25}	i	v	v	...	...	.....	C51, 7300
Ω n552	2-Nonanone*	Heptyl methyl ketone. $CH_3(CH_2)_6COCH_3$	142.24	λ < 200	−7.46	195.3^{760} 73.8^{10}	0.8208_4^{20}	1.42096^{20}	i	s	s	v	s	chl. MeOH v	B1³, 2887

For explanations, symbols and abbreviations see beginning of table. For structural formulas see end of table.